

**REMARKS**

With the entry of this Response, Claims 1-24 are pending. Claims 17-24 have been previously withdrawn and Claims 1-16 are under consideration. In this Response, Applicants have amended Claims 1-16. Support for currently amended Claim 1 is found in the specification at least in paragraphs [0001], [0011], [0015], [0021], [0037]-[0040], and [0082]. Claims 2-16 are currently amended to recite standard claim preamble language. Support for the amendments to Claims 2-16 is found in the claims as originally filed. Applicants do not believe that these amendments constitute new matter.

**REJECTION UNDER 35 U.S.C. § 102(B)**

The Office Action rejected Claims 1-12 and 15 under 35 U.S.C. § 102(b) as being anticipated by Orphan *et al.*, “Culture-Dependent and Culture-Independent Characterization of Microbial Assemblages Associated with High-Temperature Petroleum Reservoirs,” *Appl. Environ. Microbiol.*, 66(2): 700-711 (2000) (herein “Orphan”). Applicants respectfully traverse this rejection to the extent that it applies to the claims as amended.

A proper rejection of a claim under 35 U.S.C. § 102(b) requires that a single prior art reference disclose each and every element of the claim. Alternatively, anticipation requires that each and every element of the claimed invention be embodied in a single prior art device or practice. For anticipation, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. (*See, e.g., W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983); *In re Paulsen*, 30 F.3d 1475 (Fed. Cir. 1994); *In re Spada*, 911 F.2d 705 (Fed. Cir. 1990); *Minnesota Min. & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559 (Fed. Cir. 1992); *Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565 (Fed. Cir. 1991). Thus, in making a rejection under 35 U.S.C. § 102, the Patent Office is burdened with establishing that the cited art teaches each and every element of the claims.

As noted by the Office Action, Orphan teaches “detecting the presence of thermophilic microorganisms” which were detected from pooled samples of multiple well heads. (Abstract). Orphan states that “a composite sample of Monterey formation water taken from a representative number of production well heads from the South Elwood field in January 1996” to construct 16S

rDNA libraries O1 and O2. (p. 701, col. 1, paragraph 3). Orphan does not teach characterizing or monitoring hydrocarbon zones. As Orphan is directed to using pooled samples to form its rDNA libraries, Applicants respectfully submit that Orphan fails to teach or disclose a method of characterizing or monitoring a hydrocarbon zone.

For at least these reasons, Applicants respectfully submit that Orphan fails to teach or disclose each and every element Applicants' currently amended Claim 1, and therefore, Orphan fails to anticipate Claim 1. As Claims 2-12 and 15 depend from and incorporate every element of Claim 1, Applicants respectfully submit that Orphan also fails to anticipate these dependent claims. Applicants respectfully request that the Examiner withdraw this rejection and allow Claims 1-12 and 15.

**REJECTIONS UNDER 35 U.S.C. § 103(A)**

1. The Office Action rejected Claim 13 under 35 U.S.C. § 103(a) as obvious over Orphan in view of Blume *et al.*, "Surface and subsurface microbial biomass, community structure and metabolic activity as a function of soil depth and season," *Appl. Soil Ecology*, 20: 171-181 (2002) (herein "Blume"). Applicants respectfully traverse this rejection.

Under 35 U.S.C. § 103(a), the Patent Office bears the burden of establishing a *prima facie* case of obviousness. A *prima facie* case of obviousness requires: (1) that there be a suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the teachings of reference or to combine the teachings of multiple references; (2) that there be a reasonable expectation of success; and (3) that the prior art reference, or references when combined, teach or suggest all of the elements of the claim. (*See, e.g.*, M.P.E.P. § 2143). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and cannot be based on Applicants' disclosure. (*See, e.g., In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991); *In re Fine*, 87 F.2d 1071, 1074 (Fed. Cir. 1988)). Furthermore, rejections based on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be explicit analysis including some rational underpinning to support the legal conclusion of obviousness. (*K.S.R. Int'l Co. v. Teleflex, Inc.*, 550 U.S. 14 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). If the references do not teach each and every claimed element, then a finding of obviousness fails.

Applicants note that Claim 13 is a dependent claim. The Office Action has not rejected, under 35 U.S.C. § 103(a), independent Claim 1, from which Claim 13 depends. Applicants note that “dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious.” (*In re Fine*, 5 U.S.P.Q.2d 1569, 1600 (Fed. Cir. 1988)). For this reason alone, Applicants respectfully submit that the Office Action failed to establish a *prima facie* case of obviousness for currently pending Claim 13. Therefore, Applicants respectfully request that the Examiner withdraw this rejection and allow this claim.

The Office Action stated that “Orphan et al teaches a genotypic analysis of a sample and detecting the presence of thermophilic microorganisms. The genotypic analysis performed by Orphan is performed on rDNA libraries made from the combination of multiple samples taken from “a representative number of production wellheads”. (Orphan, page 701). The pooled data from multiple wellheads of Orphan cannot provide a teaching or suggestion of characterizing or monitoring a hydrocarbon zone. The method of Orphan does not provide sufficient data for characterizing or monitoring a hydrocarbon zone.

The Office Action stated that “Blume et al teaches the analysis of microbial community structure as a function of sample depth.” The Office Action stated that it would have been *prima facie* obvious to perform “an association analysis between detected microorganisms and depth, as taught by Blume et al, in the analysis of microorganisms detected in oil reservoir production fluids as Orphan et al. The combination of a method that pools multiple sample data, as taught by Orphan, with a method that finds an association between depth and detected microorganisms, results in a combination that defeats the purpose for each of the initial methods. One can only draw limited conclusions from pooled sample data, and only if all samples are identical are the conclusions universally applicable.

The combination of the teaching of Orphan, a method that uses a pooled result from multiple wellheads, with a method that purports to draw conclusions about sample data, does not result in a teaching or suggestion of Applicants’ currently claimed invention. For at least these reasons, whether considered individually, or in combination with one another, the cited references fail to provide a teaching or suggestion of Applicants’ currently claimed invention. Consequently, the combination of these references fails to render as obvious Applicants’ currently pending independent Claim 1 and fails to render as obvious Applicants’ currently pending dependent Claim 13.

Applicants respectfully request that the Examiner withdraw this rejection and allow this claim.

2. The Office Action rejected Claim 14 under 35 U.S.C. § 103(a) as obvious over Orphan in view of Rawat *et al.*, “Geo-Microbial Exploration for Hydrocarbon – A Promising Technique,” *Appl. Environ. Microbiol.*, 3: 297-200 (1994) (herein “Rawat”). Applicants respectfully traverse this rejection.

Under 35 U.S.C. § 103(a), the Patent Office bears the burden of establishing a *prima facie* case of obviousness. A *prima facie* case of obviousness requires: (1) that there be a suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the teachings of reference or to combine the teachings of multiple references; (2) that there be a reasonable expectation of success; and (3) that the prior art reference, or references when combined, teach or suggest all of the elements of the claim. (*See, e.g.*, M.P.E.P § 2143). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and cannot be based on Applicants’ disclosure. (*See, e.g., In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991); *In re Fine*, 87 F.2d 1071, 1074 (Fed. Cir. 1988)). Furthermore, rejections based on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be explicit analysis including some rational underpinning to support the legal conclusion of obviousness. (*K.S.R. Int’l Co. v. Teleflex, Inc.*, 550 U.S. 14 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). If the references do not teach each and every claimed element, then a finding of obviousness fails.

Applicants note that Claim 14 is a dependent claim. The Office Action has not rejected, under 35 U.S.C. § 103(a), independent Claim 1, from which Claim 14 depends. Applicants note that “dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious.” (*In re Fine*, 5 U.S.P.Q.2d 1569, 1600 (Fed. Cir. 1988)). For this reason alone, Applicants respectfully submit that the Office Action failed to establish a *prima facie* case of obviousness for currently pending Claim 14. Therefore, Applicants respectfully request that the Examiner withdraw this rejection and allow the claim.

The Office Action stated that “Orphan *et al* teaches a genotypic analysis of a sample and detecting the presence of thermophillic microorganisms. The genotypic analysis performed by Orphan is performed on rDNA libraries made from the combination of multiple samples taken from

“a representative number of production wellheads”. (Orphan, page 701). The pooled data from multiple wellheads of Orphan cannot provide a teaching or suggestion of characterizing or monitoring a hydrocarbon zone. The method of Orphan does not provide sufficient data for characterizing or monitoring a hydrocarbon zone.

The Office Action stated that Rawat “teaches the geo-microbial methods may be used for the exploration for hydrocarbons.” The Office Action stated that it would have been prima facie obvious to “have used the methods of Orphan et al in an analysis of hydrocarbon zone migration routes. One would have been motivated to do so based on the teachings of Rawat et al that geo-microbial methods may be used to explore for hydrocarbons and the results of Orphan et al that particular microorganism profiles are indicative of fluids obtained from hydrocarbon reservoirs.” Applicants submit that Orphan teaches a method of pooling samples from multiple representative wellheads and that such data showed that “a large percentage of the identified clones were highly similar to known bacterial and archaeal isolates recovered from similar habitats.” (See Orphan, Abstract). Applicants respectfully submit that a method resulting in data from pooled samples has limited applicability and is not useful for analyzing hydrocarbon migration routes. The combination of a method using pooled sample data with geo-microbial methods does not result in a teaching or suggestion of Applicants’ currently claimed invention.

The combination of the teaching of Orphan, a method that uses a pooled result from multiple wellheads, with a method that may intend to correlate phenotypic characteristics with locations, does not result in a teaching or suggestion of Applicants’ currently claimed invention. For at least these reasons, whether considered individually, or in combination with one another, the cited references fail to provide a teaching or suggestion of Applicants’ currently claimed invention. Consequently, the combination of these references fails to render as obvious Applicants’ currently pending independent Claim 1 and fails to render as obvious Applicants’ currently pending dependent Claim 14. Applicants respectfully request that the Examiner withdraw this rejection and allow this claim.

3. The Office Action rejected Claim 16 under 35 U.S.C. § 103(a) as obvious over Orphan in view of Muyzer *et al.*, “Profiling of Complex Microbial Populations by Denaturing Gradient Gel Electrophoresis Analysis of Polymerase Chain Reaction-Amplified Genes Coding for 16S rRNA,” *Appl. Environ. Microbiol.*, 59: 695-700 (1993) (herein “Muyzer”). Applicants respectfully traverse

this rejection.

Under 35 U.S.C. § 103(a), the Patent Office bears the burden of establishing a *prima facie* case of obviousness. A *prima facie* case of obviousness requires: (1) that there be a suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the teachings of reference or to combine the teachings of multiple references; (2) that there be a reasonable expectation of success; and (3) that the prior art reference, or references when combined, teach or suggest all of the elements of the claim. (See, e.g., M.P.E.P § 2143). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and cannot be based on Applicants' disclosure. (See, e.g., *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991); *In re Fine*, 87 F.2d 1071, 1074 (Fed. Cir. 1988)). Furthermore, rejections based on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be explicit analysis including some rational underpinning to support the legal conclusion of obviousness. (*K.S.R. Int'l Co. v. Teleflex, Inc.*, 550 U.S. 14 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). If the references do not teach each and every claimed element, then a finding of obviousness fails.

Applicants note that Claim 16 is a dependent claim. The Office Action has not rejected, under 35 U.S.C. § 103(a), independent Claim 1, from which Claim 16 depends. Applicants note that "dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious." (*In re Fine*, 5 U.S.P.Q.2d 1569, 1600 (Fed. Cir. 1988)). For this reason alone, Applicants respectfully submit that the Office Action failed to establish a *prima facie* case of obviousness for currently pending Claim 16. Therefore, Applicants respectfully request that the Examiner withdraw this rejection and allow these claims.

The Office Action stated that "Orphan et al teaches a genotypic analysis of a sample and detecting the presence of thermophilic microorganisms. The genotypic analysis performed by Orphan is performed on rDNA libraries made from the combination of multiple samples taken from "a representative number of production wellheads". (Orphan, page 701). The pooled data from multiple wellheads of Orphan cannot provide a teaching or suggestion of characterizing or monitoring of a hydrocarbon zone. The method of Orphan does not provide sufficient data for characterizing or monitoring a hydrocarbon zone.

The Office Action stated that Muyzer "teaches methods for the amplification of 16s rDNA

sequences from mixed populations of microbes”, and that it would have been obvious to use “the primer according to Muyzer et al in the analysis of samples as performed by Orphan et al.” As the method of Orphan cannot be used to characterize or monitor an area, the addition of Muyzer’s teaching of a particular probe does not provide the motivation to combine the references to yield Applicants’ currently claimed invention, nor does the addition of Muyzer cure the deficiencies of Orphan in teaching or suggesting Applicants’ currently claimed invention.

For at least these reasons, whether considered individually, or in combination with one another, the cited references fail to provide a teaching or suggestion of Applicants’ currently claimed invention. Consequently, the combination of these references fails to render as obvious Applicants’ currently pending independent Claim 1 and fails to render as obvious Applicants’ currently pending dependent Claim 16. Applicants respectfully request that the Examiner withdraw this rejection and allow this claim.

**CONCLUSION**

The foregoing is a complete response to the Office Action dated October 6, 2009. Applicants respectfully submit that at least Claims 1-24 are patentable. Early and favorable consideration is solicited.

Applicants file this response solely to facilitate prosecution. As such, Applicants reserve the right to pursue claims of broader or similar scope as originally filed in a continuation application or other application after allowance of the present application. Applicants do not concede that the current or past rejections are correct and reserve the right to challenge such rejections later in prosecution or on appeal. Accordingly, any amendment, argument, or claim cancellation is not to be construed as abandonment or disclaimer of subject matter. Because certain of the current amendments may include broadening amendments, Applicants respectfully request that the Examiner revisit any previously reviewed references cited in this Application to further ensure that the currently pending claims remain patentable over any previously reviewed references. If the Examiner believes there are other issues that can be resolved by a telephone interview, or that there are any informalities that remain in the application that may be corrected by the Examiner's amendment, then the undersigned attorney respectfully solicits a telephone call at 678-420-9428.

With this Amendment and Response, Applicants also enclose a Request for Continued Examination pursuant to 37 C.F.R. § 1.114, a Petition for an Extension of Time pursuant to 37 C.F.R. § 1.136(a), and a credit card payment in the amount of \$1,920.00, which represents the \$1110 large entity fee for a three-month extension of time pursuant to 37 C.F.R. § 1.17(a)(3) and the \$810 large entity fee for a Request for Continued Examination pursuant to 37 C.F.R. § 1.17(e). Applicants believe that this is the correct amount due; however, Applicants hereby authorize the Commissioner to charge to Deposit Account No. 14-0629 any additional fees that may be required, or to credit to that same account any overpayment of fees.

Respectfully submitted,  
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